99-29-00 A

New, Continuation, Divisional, or Continuation-in-Part Application Under 37 C.F.R. Section 1.53(b)

Attorney Docket No. INL-00056

Express Mail Label No. EK 667 145 175 US

Date: September 28, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Transmitted herewith for filing under 37 C.F.R. Section 1.53 (b) is a patent application for:

BEVEL EDGING WHEEL WITH SWARF CLEARANCE

identified by: [ ] First named inventor _____
or [X] Attorney Docket No. (see above)

1. Type of Application

[X] This application is a new (non-continuing) application.

[ ] This application is a [ ] continuation / [ ] divisional / [ ] continuation-in-part of prior application No. _____. Amend the specification by inserting before the first line, the sentence:

--This is a [continuation/division/continuation-in-part] of United States patent application No. _____, filed _____.--

[ ] The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

If for some reason applicant has not requested a sufficient extension of time in the parent application, and/or has not paid a sufficient fee for any necessary response in the parent application and/or for the extension of time necessary to prevent the abandonment of the parent application prior to the filing of this application, please consider this as a Request for an Extension for the required time period and/or authorization to charge Deposit Account No. _____ (_____) for any fee that may be due. THIS FORM IS BEING FILED IN TRIPLICATE: one copy for this application; one copy for use in connection with the Deposit Account (if applicable); and one copy for the above-mentioned parent application (if any extension of time is necessary).

2. Contents of Application

a. Specification of 10 pages;
[ ] a microfiche computer program (Appendix);
[ ] a nucleotide and/or amino acid sequence submission;

[ ] Because the enclosed application is in a non-English language, a verified English translation [ ] is enclosed [ ] will be filed.

[ ] Cancel original claims _____ of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing date purposes.)

b. [X] Drawings on two (2) sheets;

c. [X] A signed Oath/Declaration [ ] is enclosed / [X] will be filed in accordance with 37 C.F.R. Section 1.53(f).

The enclosed Oath/Declaration is [ ] newly executed / [ ] a copy from a prior application under 37 C.F.R. Section 1.63(d) / [ ] accompanied by a statement requesting the deletion of person(s) not inventors in the continuing application.

d. **Fees**

FILING FEE CALCULATION	Number Filed				Number Extra		Rate		Basic Fee $690.00
Total Claims	20	-	20	=	0	x	$18.00	=	$ 0
Independent Claims	3	-	3	=	0	x	$78.00	=	$ 0
Multiple Dependent Claim(s) Used							$260.00	=	$ 0
FILING FEE – NON-SMALL ENTITY									$690.00
FILING FEE – SMALL ENTITY: Reduction by ½									$ 0
[ ] Verified Statement under 37 C.F.R. Section 1.27 is enclosed.									
[ ] Verified Statement filed in prior application.									
Assignment Recordal Fee ($40.00)									$ 0
37 C.F.R. Section 1.17(k) Fee (non-English application)									$ 0
TOTAL									**$690.00**

[ ] A check is enclosed to cover the calculated fees. The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. _____ (_____). A duplicate copy of this document is enclosed.

[X] The calculated fees will be paid within the time allotted for completion of the filing requirements.

[ ] The calculated fees are to be charged to Deposit Account No. _____ (_____). The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to said Deposit Account. A duplicate copy of this document is enclosed.

3. Priority Information

[ ] **Foreign Priority:** Priority based on _____(country) Application No. _____, filed _____, and _____(country) Application No. _____, filed _____, is claimed.

[ ] A copy of the above referenced priority documents [ ] is enclosed / [ ] will be filed in due course, pursuant to 35 U.S.C. Section 119(a)-(d).

[ ] **Provisional Application Priority:** Priority based on United States Provisional Application No. _____, filed _____, is claimed under 35 U.S.C. Section 119(e).

4. Other Submissions

[ ] A Preliminary Amendment is enclosed.

[ ] An Information Disclosure Statement, _____ sheets of PTO Form 1449, and _____ patent(s)/publication(s)/document(s) are enclosed.

[X] A power of attorney

[X] is submitted [X] with the new Oath/Declaration.

[ ] is of record in the prior application and [ ] is in the original papers / [ ] a copy is enclosed.

[ ] An Assignment of the invention

[ ] is enclosed with a cover sheet pursuant to 37 C.F.R. Sections 3.11, 3.28 and 3.31.

[ ] is of record in a prior application. The assignment is to _____, and is recorded at Reel _____, Frame(s) _____.

[ ] An Establishment of Assignee's Right to Prosecute Application Under 37 C.F.R. Section 3.73(b), and Power of Attorney is enclosed.

[X] An Express Mailing Certificate is enclosed.

[X] Other: Return Receipt Postcard_____

_____

Attorney Docket No. INL-00056

Express Mail Label No. EK 667 145 175 US

Date: September 28, 2000

Attention is directed to the fact that the correspondence address for this application is:

Warn IP Law Office
P.O. Box 70098
Rochester Hills, Michigan 48307
(248) 627-1133

Respectfully submitted,

WARN IP LAW OFFICE
Attorneys for Applicant(s)

By: _____
Philip R. Warn
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Rochester Hills, Michigan 48307
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Dated: September 28, 2000

PRW:jmz

BEVEL EDGING WHEEL WITH SWARF CLEARANCE

Technical Field

The present invention relates to a bevel edging wheel of the type used for edging of an optical edge. More specifically, the present invention relates to a bevel edging wheel which reduces the necessary manual removal of swarf from the lens after edging of an optical lens.

Background of the Invention

Optical lenses made of polycarbonates, high index and CR39 materials are known in the art. In order to finish and make these lenses ready for fitting into a lens frame, it is necessary to bevel edge the outer periphery of the lens, to give it the proper cross-section to fit in an eye glass lens frame. Typically, this is done by a bevel edging machine, which includes a rough cut wheel for cutting out the shape and a bevel edging wheel for providing the final contour. Depending on the lens material, the grinding operation creates abrasive swarf material which requires removal in order for proper use of any type of abrasive device. Typically, the wheels have build up of swarf during the operation, which imparts itself onto the lens. This creates the need to manually remove the swarf from the lens. Any swarf which is not readily removed during the grinding of the bevel edging operation, interferes with the operation and, at the very least, slows it down and may add to several hand finishing steps necessary at the end, or an improper bevel configuration.

In the optical industry today, the one hour optical labs and the like have made it necessary for increased any improved efficiencies are desirable in the process.

Therefore, it is desired to eliminate swarf removal on the polycarbonate lens by hand, which is labor intensive and time consuming.

Therefore, it is a goal in the art to provide a bevel edging wheel which eliminates the need for manual swarf removal.

Summary of the Invention

In accordance with the present invention, there is provided a bevel ending wheel for edge finishing of an optical lens blank. The lens comprises a hub portion which is adapted for attachment to a rotary power source. The wheel includes an outer circumferential cutting surface having a width. The outer circumferential cutting surface includes an abrasive grit attached thereto and also has a circumferential groove therein for forming an edge contour onto an optical lens. The wheel includes a radially extending planar side portion, and in a preferred embodiment, has at least one swarf clearing groove extending at an angle to said side portion across the circumferential groove and opening into the planar side portion, which allows removal of swarf out through the planar side portion.

A further understanding of the present invention will be had in view of the description of the drawings and detailed description of the invention, when viewed in conjunction with the subjoined claims.

Brief Description of the Drawings

Figure 1 is a perspective view of the bevel edging wheel of the present invention;

Figure 2 is a plan view of the bevel edging wheel of the present invention;

Figure 3 is a top view of the bevel edging wheel of the present invention;

Figure 4 is a sectional side view taken along line 4-4 of Figure 2; and

Figure 5 is a detailed side view showing the swarf clearing groove of the present invention.

Detailed Description of the Preferred Embodiments

In accordance with the present invention, there is provided a rotary edging wheel generally shown at 10 for edge finishing of an optical lens. The bevel edge wheel of the present invention includes a hub portion generally indicated at 12 and an outer circumferential cutting surface generally indicated at 14.

Referring now to Figures 2-4, an outer circumferential cutting surface includes a width W and has a circumferential groove 16 formed therein. Abrasive grit material is attached to the outer surface 14 and within the groove 16 for cutting of the lens. The wheel of the present invention includes at least one swarf clearing groove 18 which extends at least through the groove 16 to an outer planar surface of the wheel 20 or 22. The swarf clearing groove extends to the outer planar surface for removal or swarf during cutting of the lens.

In a preferred embodiment, the angle of the swarf clearing groove 18 may be 40 degrees from a side wall. Generally, the groove would be angled from about 10 degrees to about 80 degrees in relation to the side wall 20. Typically, the groove is formed at an angle of about 15 degrees to about 65 degrees, and preferably from about 35 degrees to about 45 degrees. In a preferred embodiment, the groove extends along the entire width of the wheel W. However, it will be readily appreciated that it is only necessary to run the groove from the bevel edge forming portion of the wheel to the exterior of the wheel, such that swarf can be removed along the groove.

Referring to Figure 5, the groove 18 has planar sides 24 and 26 which extend perpendicular to outer surface 14. In a preferred embodiment, a 1/8" wide and .060" deep slot is formed in the wheel, generally from 20 degrees to 80 degrees slot angles, and preferably 4o degrees to 70 degrees, with 60 degrees preferred. While at least one of the slots is necessary, preferably a plurality of slots is utilized which are equiangular spaced around the outer periphery. Generally, from greater than 1 to about 20 slots are used, and preferably 4 to about 8, with 6 being preferred.

Bevel edging wheels made in accordance with the present invention are readily used in bevel edging machines such as those made by Weco, Colburn or the like. Such machines are readily known to those skilled in the art, as well as their operation. While bevel grooves are disclosed, the wheel of the present invention can be used without a bevel groove such as in a rimless flat style wheel.

The cross-section of the beveling groove may be any of the desirable cross-sections for use of the lens in a glass frame of those known in the art. Typically, it is an angled section of about 105 degrees, as shown in the drawings. However, other configurations may be readily adapted to the present invention. Typically, the abrasive grits used in the present invention are from about 5-10 microns to about 100-120 mesh. Preferably, the grits are attached by brazing the abrasive grit onto the wheel. However, the grit surface may also be attached by sintering electroplating or resin bonding, with a preferred abrasive grit material being a diamond-like hardness abrasive grit. However, other materials such as silicon carbides, tungsten carbides, oxides, garnets, cubic boron nitride, and natural and synthetic diamonds may be used alone or in combination in the present invention. It has been found that the wheel of the present invention eliminates about 90 percent of the swarf from the edge of polycarbonate, high index and CR39 lens materials.

Those skilled in the art can now appreciate from the foregoing description that the broad teachings of the present invention can be implemented in a variety of forms. Therefore, while this invention has been described in connection with particular examples thereof, the true scope of the invention should not be so limited, since other modifications will become apparent to the skilled practitioner upon a study of the drawings, specification and following claims.

Claims

1. A rotary edging wheel for edge finishing of an optical lens comprising:

a hub portion adapted for attachment to a rotary power source;

an outer circumferential cutting surface having a width, said surface including an abrasive grit attached thereto;

a radially extending planar side portion;

at least one swarf clearing groove extending at an angle at least across a part of said surface; and

an opening into said planar side for removal of swarf out through said planar side.

2. The bevel edging wheel of claim 1 further comprising a plurality of said swarf clearing slots formed in said circumferential cutting surface.

3. The bevel edging wheel of claim 1 wherein said swarf clearing slot extends along a portion of the cutting surface.

4. The bevel edging wheel of claim 1 wherein said swarf clearing slot extends along the entire length of said cutting surface.

5. The bevel edging wheel of claim 1 wherein said slot has an angle of from about 10 degrees to about 80 degrees.

6. The bevel edging wheel of claim 1 wherein said slot has an angle of from about 15 degrees to about 65 degrees.

7. The bevel edging wheel of claim 1 wherein said slot has an angle of from about 35 degrees to about 45 degrees.

8. The bevel edging wheel of claim 1 wherein the abrasive grit is attached to the wheel by brazing, electroplating, sintering or resin bonding.

9. The bevel edging wheel of claim 8 wherein said abrasive grit is a diamond hardness grit.

10. A rotary bevel edging wheel for edge finishing of an optical lens comprising:

a hub portion adapted for attachment to a rotary power source;

an outer circumferential cutting surface having a width, said surface including an abrasive grit attached thereto, and having a circumferential groove therein for forming an edge contour onto an optical lens;

a radially extending planar side portion;

a plurality of at least one swarf clearing grooves extending at an angle at least across said circumferential groove; and

an opening into said planar side for removal of swarf out through said planar side.

11. The bevel edging wheel of claim 10 wherein said swarf clearing slot extends along the entire length of said cutting surface.

12. The bevel edging wheel of claim 10 wherein said slot has an angle of from about 10 degrees to about 80 degrees.

13. The bevel edging wheel of claim 10 wherein said slot has an angle of from about 15 degrees to about 65 degrees.

14. The bevel edging wheel of claim 10 wherein said slot has an angle of from about 35 degrees to about 45 degrees.

15. The bevel edging wheel of claim 10 wherein the abrasive grit is attached to the wheel by brazing, electroplating, sintering or resin bonding.

16. The bevel edging wheel of claim 15 wherein said abrasive grit is a diamond hardness grit.

17. A rotary bevel edging wheel for edge finishing of an optical lens comprising:

a hub portion adapted for attachment to a rotary power source;

an outer circumferential cutting surface having a width, said surface including an abrasive grit attached thereto, and having a circumferential groove therein for forming an edge contour onto an optical lens;

a radially extending planar side portion;

a plurality of swarf clearing grooves extending across the width of said outer circumferential cutting surface, at an angle of from about 35 to about 45 degrees to said planar side portion; and

an opening into said planar side for removal of swarf out through said planar.

18. The bevel edging wheel of claim 17 wherein the abrasive grit is attached to the wheel by brazing, electroplating, sintering or resin bonding.

19. The bevel edging wheel of claim 18 wherein said abrasive grit is a diamond hardness abrasive grit.

20. The bevel edging wheel of claim 17, wherein said abrasive grit is a diamond grit material having a mesh of from about 5-10 microns to about 100-120 mesh.

BEVEL EDGING WHEEL WITH SWARF CLEARANCE

Abstract

A bevel edge wheel having a swarf clearance slot across the shaping face. The slot reduces the amount of hand removal of swarf from a processed lens blank.

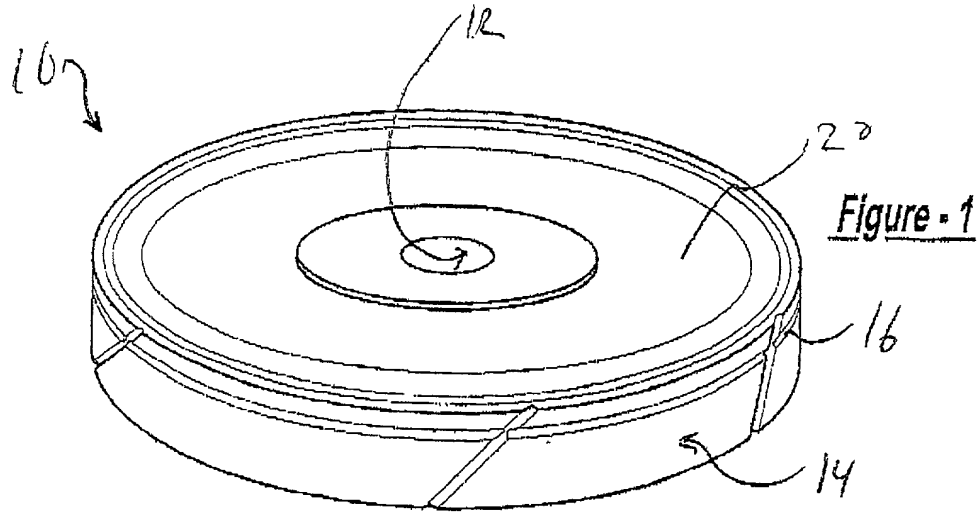

Figure - 1

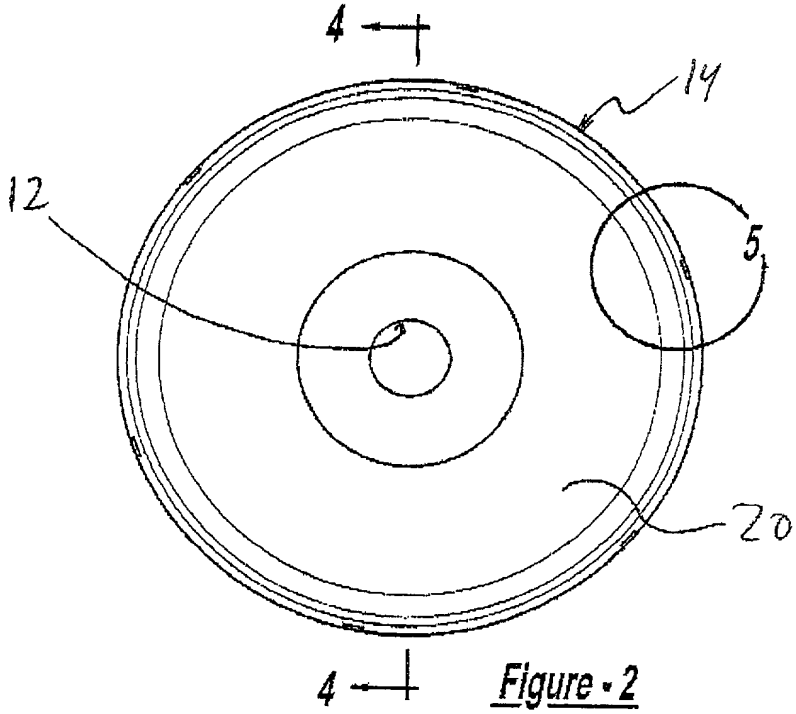

Figure - 2

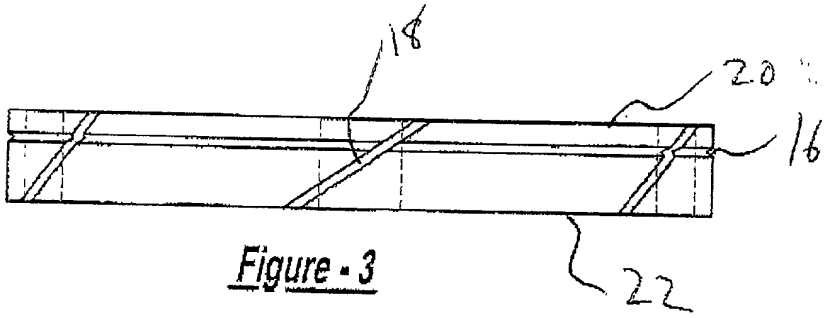

Figure - 3

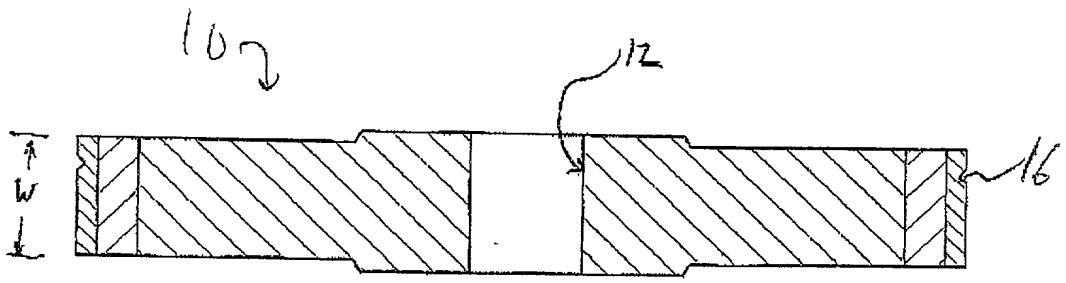

Figure - 4

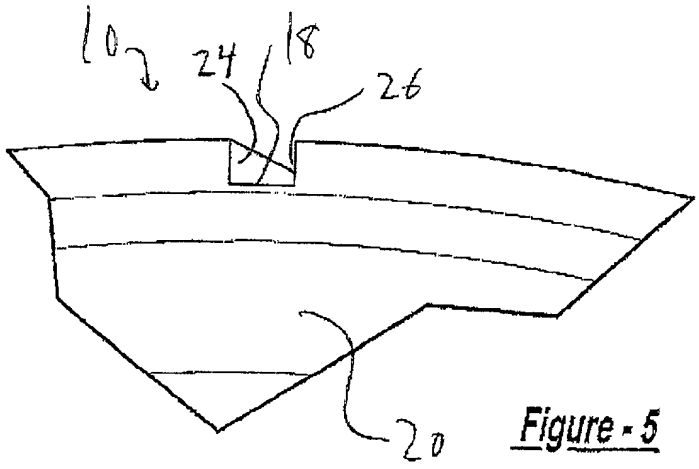

Figure - 5

Attorney Docket No. INL-00056

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

"BEVEL EDGING WHEEL WITH SWARF CLEARANCE"

the specification of which

[X] is attached hereto.

[ ] was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by an amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application or to the patentability of the invention claimed therein in accordance with Title 37,Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

			Priority Claim	
_____ (Number)	_____ (Country)	_____ (Day/Month/Year filed)	___ Yes	___ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year filed)	___ Yes	___ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year filed)	___ Yes	___ No

DECLARATION AND POWER OF ATTORNEY

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States Provisional application(s) listed below:

PRIOR PROVISIONAL APPLICATIONS

_____ (Application Serial Number)	_____ (Month/Day/Year filed)
_____ (Application Serial Number)	_____ (Month/Day/Year filed)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	Filing Date	Status – patented, pending, abandoned
_____	_____	_____
_____	_____	_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint **Philip R. Warn**, Reg. No. 32775, my attorney with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. I request the Patent and Trademark Office to direct all correspondence and telephone calls relative to this application to Warn IP Law Office, P.O. Box 70098, Rochester Hills, Michigan 48307, telephone number (248) 627-1133.

Full name of sole or first inventor: Dennis R. Raffaelli

Inventor's signature: _____

Date: _____

Residence: 1951 Royal Birkdale Drive, Oxford, Michigan 48371

Citizenship: United States of America

Post Office Address: Same as above